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(54) **Enzyme electrode**

(57) Disclosed is an enzyme electrode which comprises

- (a) an electroconductive support member (ESM) comprising a porous electroconductive layer,
- (b) an enzyme adsorbed or immobilized onto the surface of said porous layer in an catalytically effective amount, and

(c) a protecting layer to prevent leaching of said enzyme from the porous layer.

The electrode may be used for indicating amperometrically the catalytic activity of an enzyme in the presence of a liquid containing substance acted upon by the enzyme and to be detected, and in the presence of an electric potential on the electrode.

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## EUROPEAN SEARCH REPORT

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EP 96 81 0200

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant in claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,X	US 4 970 145 A (BENNETTO HUGH P ET AL) 13 November 1990  * column 5, line 39 - column 6, line 21 * * column 7, line 10 - line 23 * * column 7, line 63 - column 8, line 2 * * column 8, line 61 - column 9, line 3 * * column 9, line 9 - line 33; claims *	1-11, 17-19, 24-28	C12M1/40 C12Q1/26 C12Q1/00
Y	---	29	
D,Y	US RE34514 E (WERNET WOLFGANG ET AL) 18 January 1994 * abstract; claim 1 *	29	
A	DATABASE WPI Section Ch, Week 8912 Derwent Publications Ltd., London, GB; Class A89, AN 89-091252 XP002071121 & JP 63 307 350 A (CAMBRIDGE LIFE SCIENCES) * abstract *	1,2,4	
A	DATABASE WPI Section Ch, Week 9519 Derwent Publications Ltd., London, GB; Class A26, AN 95-144925 XP002071122 & JP 07 070 312 A (NEC CORP) * abstract *	12,29	C120
A	DATABASE WPI Section Ch, Week 8723 Derwent Publications Ltd., London, GB; Class B04, AN 87-159652 XP002071123 & JP 58 061 459 A (HITACHI LTD) * abstract *	18-20	
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The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 10 July 1998	Examiner Ceder, O
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>a : member of the same patent family, corresponding document</p>			



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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 415 124 A (NIPPON ELECTRIC CO) 6 March 1991 * abstract; claims 1,4 *	21-23	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
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